Supreme Court, U.S.
FILED

01-677 NOV - 5 2001

OFFICE OF THE CLERK

No. 01-

IN THE

Supreme Court of the United States

PTI TECHNOLOGIES, INC.,

Petitioner,

v.

PALL CORPORATION TECHNOLOGIES, INC.,

Respondent.

Petition for Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

PETITION FOR WRIT OF CERTIORARI

Arthur Wineburg
Counsel of Record
Pillsbury Winthrop, LLP
1600 Tysons Boulevard
McLean, Virginia 22102
(703) 905-2000

Counsel for Petitioner
PTI Technologies, Inc.

November 5, 2001

55 P

QUESTION PRESENTED

In *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., a/k/a SMC Corp and SMC Pneumatics, Inc.*, 234 F.3d 558, 56 USPQ2d 1865 (Fed. Cir. 2000) (*en banc*), *cert. granted*, __U.S.__, 121 S. Ct. 2519, 150 L.Ed.2d 692, 69 U.S.L.W. 3673 (U.S. June 18, 2001) (No. 00-1543), the United States Court of Appeals for the Federal Circuit held that any amendment related to a statutory requirement for patentability that narrows a patent claim creates "prosecution history estoppel"; the estoppel effectuates a complete bar to the application of the "doctrine of equivalents".

This decision wrought a fundamental change in the patent laws.

Under the law in effect prior to *Festo*, the doctrine of equivalents would have applied to the petitioner's patent. *Festo* was decided after this appeal was fully briefed, and, solely based upon the authority of *Festo*, the Federal Circuit held that petitioner could not show infringement of its patent under the doctrine of equivalents due to amendments made to the patent claims during prosecution.

On June 18, 2001, a petition for *certiorari* in *Festo* was granted which presented an identical issue to the one contained in this petition, namely:

1) Whether a finding of prosecution history estoppel completely bars the application of the doctrine of equivalents.

PARTIES TO THE PROCEEDING

ESCO Technologies Incorporated, St. Louis, Missouri is the parent company of the Petitioner, PTI Technologies, Inc.[1]

[1] There are no publicly held companies that possess a ten percent (10%) or greater interest in ESCO Technologies Incorporated.

PTI Technologies, Inc. hereby petitions for a writ of *certiorari* to review the judgment of the United States Court of Appeals for the Federal Circuit in this case.

OPINIONS AND ORDERS BELOW

The Federal Circuit's decision entering opinion and order in favor of respondent Pall Corporation ("Pall") (App. 1a-19a) is reported at 259 F.3d 1383. Prior opinions include the district court's summary judgments of non-infringement in favor of both petitioner and respondent and denial of applications for permanent injunction (App. 20a-46a).

STATEMENT OF THE BASIS FOR JURISDICTION

The Federal Circuit entered its opinion and order on August 7, 2001. Accordingly, this Court has jurisdiction pursuant to 28 U.S.C. § 1254(1).

CONSTITUTIONAL AND STATUTORY PROVISIONS INVOLVED

Article 1, section 8, clause 8 of the Constitution provides:

"Congress shall have the power . . . to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their Respective Writings and discoveries."

35 U.S.C. § 271(a) provides:

"Except as otherwise provided in this title, whoever without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into

the United States any patented invention during the term of the patent therefor, infringes the patent."

STATEMENT OF THE CASE

This case was decided squarely on the authority of the Federal Circuit's decision in *Festo*, now awaiting this Court's review on a petition for *certiorari*. In *Festo*, the Federal Circuit virtually abolished the "doctrine of equivalents" by creating a set of bright-line rules to govern its application in instances where prosecution history estoppel arises.

Petitioner owns a patent relating to filters made of fluorocarbon resins used in the process of etching semiconductor chips. During prosecution of this patent, claim 1 was amended to recite that an element of the filter (the so-called "net supporters") be made of one of three specified "fully fluorinated" polymers (PFA, FEP or EPE).[2] (App. 36a). The net supporters of respondent's accused infringing filter are made of a *mixture* of one of the polymers specified in the amended claim (FEP), and PTFE, a fully fluorinated polymer that was not specified in the claim. (App. 38a-39a). On appeal, petitioner argued infringement under the doctrine of equivalents, based on uncontroverted evidence that the accused filter elements composed of this FEP/PTFE mixture performed the claimed functions in the same way to produce the same result.[3]

---

[2] The claim originally recited net supporters made of "thermoplastic fluorocarbon resin", rather than specifying the specific copolymer resins: PFA (tetrafluoroethylene/perfluoroalkyl vinyl ether), FEP (tetrafluoroethylene/hexafluoropropylene) EPE (tetrafluoroethylene/hexafluoropropylene/perfluoroalkyl vinyl ether).

[3] Under the doctrine of equivalents, "a product or process that does not literally infringe upon the express terms of a patent claim may

At the time this invention was made, no one had made or disclosed making materials from a mixture of these polymers. This presented a classic occasion for application of the doctrine of equivalents—where, after the invention is made, an advance in technology provides an equivalent material (here a mixture of PTFE and the specifically claimed FEP) that performs the same function in the same way to achieve the same results as the claimed material.[4] Because net supporters made of a combination of PTFE and other fluorocarbons did not exist at the time of the invention, they were not contemplated or discussed during prosecution of the patent. So, the claim could not have been amended to exclude respondent's FEP/PTFE mixture, and an estoppel barring equivalents would not have arisen from the amendment. Under the law in existence at the time of this appeal, which had only recently been clarified in *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17 (1997), the doctrine of equivalents would have applied.

However, after the case was fully briefed and just prior to the scheduled hearing, the Federal Circuit entered its *en banc* decision in *Festo*. And based on *Festo* the Federal Circuit held that the doctrine of equivalents was not

---

nonetheless be found to infringe if there is 'equivalence' between the elements of the accused product or process and the claimed elements of the patented invention." *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 21 (1997).

[4] *Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc.*, 145 F.3d 1303, 1310 (Fed. Cir. 1998) (structure based on later developed technology can be "equivalent"); *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931- 938 (Fed. Cir. 1987) (*en banc*) ("later developed . . . technology . . . should be deemed within the scope of the claims to avoid the pirating of an invention"); and *Hughes Aircraft Co. v. United States*, 140 F.3d 1470, 1475 (Fed. Cir. 1998) (later developed technology "obfuscated the significance" of claim limitation).

"available as to the net supporters limitation of claim 1" because the claim was amended during the prosecution of the patent. (App. 11a). On that basis this Court affirmed the district court's finding of no infringement.

REASONS FOR GRANTING THE WRIT

Petitioner seeks review because if the Court decides that *Festo's* absolute bar approach to application of the doctrine of equivalents for an amended claim is not the law, the sole basis for the Federal Circuit's judgment in this case on infringement under the doctrine of equivalents would vanish.

CONCLUSION

Because *Festo* is determinative of the doctrine of equivalents issue in this appeal, petitioner requests the Court to hold this petition until disposition of *Festo*. If the Court reverses *Festo*, petitioner requests the Court to grant this petition, vacate the Federal Circuit decision, and remand the case to the Federal Circuit for proceedings consistent with the decision in *Festo*.

Respectfully submitted,

Arthur Wineburg
Counsel of Record
Pillsbury Winthrop, LLP
1600 Tysons Boulevard
McLean, Virginia 22102
(703) 905-2000

APPENDIX

APPENDIX
TABLE OF CONTENTS

Page

Opinion of the Court of Appeals
August 7, 2001 ..... 1a

Opinion of the District Court
December 22, 1999 ..... 20a

APPENDIX A

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

00-1203, -1215

PALL CORPORATION,

Plaintiff-Cross Appellant,

v.

PTI TECHNOLOGIES INC.,

Defendant-Appellant,

and

KURABO INDUSTRIES, LTD.,

Defendant.

H. Michael Hartmann, Leydig, Voit & Mayer, Ltd., of Chicago, Illinois, argued for plaintiff-cross appellant. With him on the brief were Christopher T. Griffith, and Gregory C. Bays.

Arthur Wineburg, Pillsbury Winthrop LLP, of Washington, DC, argued for defendant-appellant. With him on the brief were Susan T. Brown, Michael A. Conely, Michael R. Dzwonczvk, and Janine A. Carlan.

Appealed from: The United States District Court for the Eastern District of New York

Judge David G. Trager

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

00-1203, -1215

PALL CORPORATION,

Plaintiff/Cross-Appellant,

v.

PTI TECHNOLOGIES INC.,

Defendant/Appellant,

and

KURABO INDUSTRIES, LTD.,

Defendant.

DECIDED: AUGUST 7, 2001

Before SCHALL, Circuit Judge, FRIEDMAN, Senior Circuit Judge, and DYK, Circuit Judge.

DYK, Circuit Judge.

PTI Technologies Inc. ("PTI") appeals from the decision of the United States District Court for the Eastern District of New York granting the motion of Pall Corporation ("Pall") for summary judgment of non-infringement of U.S. Patent No. 4,663,041 (the "'041 patent"), the dismissal of PTI's counterclaim for infringement of the '041 patent, and the denial of PTI's request for a permanent injunction. Pall Corp. v. PTI Techs. Inc., Nos. CV-97-1134, CV-98-2871 (E.D.N.Y. Jan. 11, 2000) ("judgment" or "Pall II"). Pall cross-appeals the district court's grant of PTI's motion for

summary judgment of non-infringement of U.S. Patent No. 4,609,465 (the "'465 patent"), and the denial of Pall's request for a permanent injunction. We affirm the district court's grant of summary judgment of non-infringement of the '041 patent. Although we find that the district court adopted an improper construction of the "end cap" limitation of claim 1 of the '465 patent based on the claim language and the specification, we hold that the '465 patent should be construed to exclude any interpretation that includes subject matter disclaimed during prosecution, and we vacate and remand so that the district court may determine whether a person of ordinary skill in the art would conclude that coverage of the alleged infringing devices was disclaimed during prosecution.

BACKGROUND

After an initial filing in the U.S. District Court for the Central District of California on a patent not involved in this appeal, PTI sued Pall for infringement of the '041 patent. The case was then transferred to the U.S. District Court for the Eastern District of New York and consolidated with Pall's infringement suit against PTI on the '465 patent. This appeal concerns the '041 patent assigned to PTI and the '465 patent assigned to Pall. Both patents relate to filter technology for filtering high-temperature corrosive chemicals such as hot acids used in the etching process of semiconductor chips.

I. '041 Patent

PTI is the assignee of the '041 patent, which relates to a filter element made wholly of fluorocarbon resin. The patent addresses the shortcomings of prior art filter elements where the filter membrane Is the only part of the device that is made of fluorocarbon resin. The other non-fluorocarbon resin parts often had poor chemical and temperature resistance, and their use resulted in metal leaching. '041

patent, col. 1, ll. 37-43. Figures 1 and 2 of the '041 patent illustrate a preferred embodiment as follows:

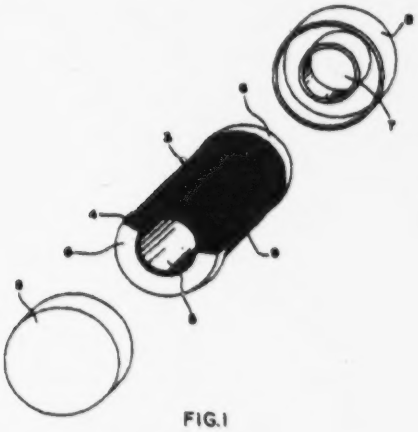

FIG.1

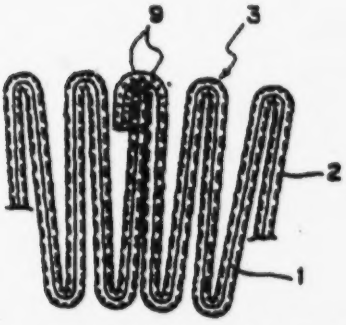

FIG.2

As illustrated in the embodiment shown in Figures 1 and 2, the filter element includes a filter material 3 produced by folding a sandwich-form sheet comprising a filter membrane 1 made of fluorocarbon resin and net supporters 2 made of thermoplastic fluorocarbon resin. The filter membrane 1 is placed between the net supporters 2 in a sandwich form, so that the filter membrane is surrounded by the net supporters as shown in Figure 2. The filter element is formed into a cylindrical shape with a central opening 5. The sealed end parts 4 of the filter element are then welded into the cylindrical fluorocarbon resin caps 8, one of which includes a central opening. While PTI originally claimed net supporters made of "thermoplastic fluorocarbon resin," PTI

later narrowed the claims by amendment to particular thermoplastic resins PFA, FEP and EPE.

The '041 patent contains five claims. Independent claim 1, which is at issue in this appeal, reads as follows:

> 1. *A filter element consisting of fluorocarbon resin elements and comprising as essential elements a filter material produced by folding a sandwich-form sheet comprising a filter membrane made of tetrafluoroethylene resin (PTFE) and net supporters made of tetrafluoroethylene/perfluoroalkyl vinyl ether copolymer resin (PFA), tetrafluoroethylene/hexafluoropropylene copolymer resin (FEP) or tetrafluoroethylene/hexafluoropropylene/perfuoroalkyl vinyl ether terpolymer resin (EPE) superimposed on the both surfaces thereof into a pleat form and liquid-tightly welding the edges parts of the both sides of the pleated sheet, sealed end parts produced by embedding the both end part of said filter material except the central openings into a thermoplastic fluorocarbon resin selected from the group consisting of PFA, FEP and EPE to force the resin into the pleats, whereby the both end parts are each integrally and tightly welded, and fluorocarbon resin caps welded liquid-tightly with said sealed end parts.*

'041 patent, col. 6,II. 30-48 (emphasis added).

Pall moved for summary judgment of non-infringement regarding the '041 patent. In a memorandum and order dated December 22, 1999, the district court construed the claims of the '041 patent and granted summary judgment of non-infringement of the '041 patent in favor of Pall. Pall

Com. v. PTI Techs. Inc., Nos. CV-97-1134, CV-98-2871 (E.D.N.Y. Dec. 22, 1999) ("order" or "Pall I").

The district court construed the claims of the '041 patent as requiring that the net supporters be made entirely of one of PFA, FEP, or EPE, and found that the claims were not literally infringed by the filter products of Pall which do not possess the claimed net supporters made entirely of PFA, FEP, or EPE. Pall I, slip op. at 18-19. The district court also held that the Pall filter products did not literally infringe because they do not have a fluorocarbon end cap welded thereto. Id. at 25. Lastly, the district court held that the Pall product did not infringe under the doctrine of equivalents. Id. at 25-26. The district court accordingly granted summary judgment in favor of Pall on the '041 patent. This judgment was entered on January 11, 2000. Pall II, slip op. at 1-2.

II. '465 Patent

Pall is the assignee of the '465 patent. The '465 patent is directed toward a filter cartridge for removing particulates from a destructive fluid such as hot acid or solvent. '465 patent, abstract, II. 1-3. Figure 1 of the patent illustrates a preferred embodiment of the filter cartridge as follows:

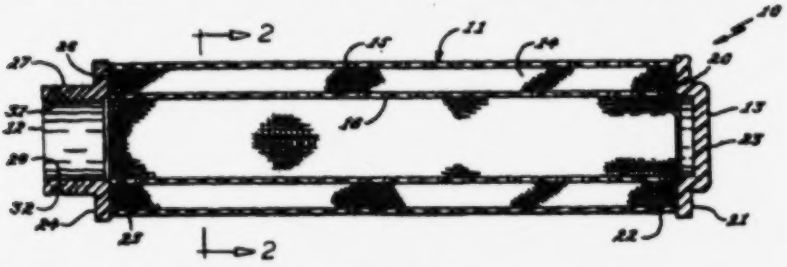

FIG. 1

As illustrated in the embodiment shown in Figure 1, the filter cartridge 10 comprises a cylindrical filter arrangement 11 with top and bottom end caps 12 and 13. In this embodiment, all of the components 11, 12, and 13 are

fabricated from fluoropolymers. Fluoropolymers are highly resistant to the deteriorative effects of destructive fluids such as acids and/or solvents. '465 patent, col. 2, II. 21-28. As shown in Figure 1, the top and bottom end caps 12 and 13 serve to support the filter arrangement and prevent the destructive fluid from bypassing the filter arrangement. Id. at col. 3, II. 15-17. In the preferred embodiment, the bottom end cap 13 completely encloses the bottom end 20 of the filter arrangement. Id. at II. 19-25. Unlike the bottom end cap, the top end cap 12 includes a central aperture 28 that allows the destructive fluid to enter or exit the central portion of the filter arrangement. Id. at II. 28-32.

During operation, the contaminated destructive fluid that surrounds the outside of the filter arrangement is passed radially inwardly through the perforated outside cage 15, through the filter composite 14, through the perforated core 16, and into the central hollow cylindrical portion of the filter cartridge. Id. at col. 3,I. 60 to col. 4, I. 1. During this process, the filter composite removes the particulates that are larger than a predetermined size. Id. at col. 4, II. 1-4. The purified liquid then passes out of the central aperture 28 in the top end cap to a reclamation system (not shown). Id. , at II. 7-10.

The '465 patent contains sixteen claims, claims 1 and 9 being at issue in this appeal. Claim 1 reads as follows:

> 1. *A filter cartridge for removing particulates from a destructive fluid, said filter cartridge comprising a cylindrical filter arrangement having a generally annular cross section and including a cylindrical microporous fluoropolymeric filter for removing particulate contaminants from fluid flowing through the filter and further including a cylindrical fluoropolymeric structure coaxially disposed adjacent the filter for supporting the filter, first and*

second impervious fluoropolymeric end caps concentrically disposed adjacent first and second ends, respectively, of the filter arrangement, said first end cap including a cylindrical protrusion projecting away from the filter arrangement and containing means defining a central aperture communicating with the center of the filter arrangement and said second end cap enclosing said second end of said filter arrangement, and a sealing ring cooperatively arranged with the first end cap, at least the external surface of said sealing ring comprising a fluoropolymeric material.

'465 patent, col. 5,ll. 36-54 (emphasis added). Claim 9, which depends from claim 1, reads as follows:

> 9. *The filter cartridge of claim 1 wherein the first and second end caps comprise a PFA fluorocarbon polymer.*

Id. at col. 6,11. 22-24 (emphasis added).

Pall filed suit, claiming that PTI had infringed claims 1 and 9 of the '465 patent. PTI moved for summary judgment on the issue of infringement by PTI's Fluoroflow™ filter cartridges of the '465 patent. In the same December 22, 1999, memorandum and order granting summary judgment of non-infringement of the '041 patent, the district court construed claims 1 and 9 of the '465 patent and granted summary judgment of non-infringement in favor of PTI. Pall I, slip op. at 6-13. In its order, the district court construed claims 1 and 9 of the '465 patent, holding that:

> *The words "first and second impervious fluoropolymeric end caps" in the context of the claims of the '465 patent means that each end cap is a unitary structure that is applied to respective*

unsealed ends of a "filter arrangement." In the context of the Miller '465 patent, the filter arrangement is an element having a generally annular cross-section and includes a cylindrical microporous fluoropolymeric filter (e.g., PTFE membrane) and a cylindrical fluoropolymeric structure adjacent the filter for supporting the filter (e.g., core). In other words, each claimed "impervious end cap" cannot comprise two separate components wherein the first component is welded to one end of an unsealed filter arrangement to provide a liguid-tight sealed end and the second component is welded onto the previously-formed sealed end.

Id. at 9 (emphasis added). The district court then performed an infringement analysis, holding that the accused Fluoroflow™ filter cartridges do not infringe because the end caps of the Fluoroflow™ filter cartridges require two components, a potting disk and a fitting, and are applied in a two-step process, whereas "the claimed 'impervious fluoropolymeric end cap' requires a single component of the claimed filter, applied in a single-step, to provide all the functions thereof . . . ." Id. at 12-13. The district court therefore held that the Fluorofow™ cartridges do not infringe claims 1 and 9 of the '465 patent either literally or under the doctrine of equivalents.

DISCUSSION

I. Jurisdiction and Standard of Review

We have jurisdiction over this appeal pursuant to 28 U.S.C. § 1295(a)(1) (1994). We review a district court's grant of a motion for summary judgment without deference. Ethicon Endo-Surgery, Inc. v. United States Surgical Corp., 149 F.3d 1309, 1315, 47 USPQ2d 1272, 1275 (Fed. Cir. 1998).

A patent infringement analysis requires two steps. Gentry Gallery, Inc. v. Berkline Corp., 134 F.3d 1473, 1476, 45 USPQ2d 1498, 1500 (Fed. Cir. 1998). "First, the claim must be properly construed to determine its scope and meaning. Second, the claim as properly construed must be compared to the accused device or process." Id. (quoting Carroll Touch, Inc. v. Electro Mech. Sys., Inc., 15 F.3d 1573, 1576, 27 USPQ2d 1836, 1839 (Fed. Cir. 1993)). Claim construction is a matter of law that is reviewed without deference. Cybor Cone. v. FAS Techs., Inc., 138 F.3d 1448, 1456, 46 USPQ2d 1169, 1174 (Fed. Cir. 1998) (en banc).Determination of infringement, whether literal or under the doctrine of equivalents, is a question of fact. Bai v. L & L Wings, Inc., 160 F.3d 1350, 1353, 48 USPQ2d 1674, 1676 (Fed. Cir. 1998).

II. '041 Patent

We first address the decision of the district court regarding PTI's '041 patent. The district court construed the language of claim 1 "net supporters made of PFA, FEP or EPE" to mean that the "net supporters must be made wholly of PFA, FEP or EPE, and cannot include any other fluorocarbon resin (e.g., PTFE) therein" and "cannot (1) be a mixture of two or more of the three materials specified or (2) contain a material other than PFA, FEP or EPE, e.g., [they cannot contain] PTFE." Pall 1, slip op. at 1415. PTI does not challenge the claim construction on this appeal, and we agree with the district court's claim construction requiring the net supporters to be made of 100% of one of the recited thermoplastic fluorocarbon resins.

Turning to infringement, the accused infringing device of Pall is an all-fluoropolymer filter with a PTFE membrane having support and drainage layers on each side of the membrane. These support and drainage layers, which correspond to the "net supporters" of the '041 patent, contain

at least 60% PTFE. Because the net supporters require the net supporters to be made wholly out of PFA, FEP or EPE, the support and drainage layers cannot literally infringe the net supporters of claim 1 of the '041 patent. In its briefs, PTI only argued that the Pall filters infringe under the doctrine of equivalents, apparently conceding that the Pall fitters do not literally infringe.

Both parties now agree that our decision in Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558, 56 USPQ2d 1865 (Fed. Cir. 2000) (en banc), cert. granted, 69 U.S.L.W. 3673 (U.S. June 18, 2001) (No. 00-1543), issued after the submission of briefs, forecloses resort to the doctrine of equivalents as to the net supporters limitation. Here the patentee originally broadly claimed "net supporters made of thermoplastic fluorocarbon resin" but later amended the claim in light of a prior art rejection to recite "net supporters made of tetrafluoroethylene/ perfluoroalkyl vinyl ether copolymer resin (PFA), tetrafluoroethylene/hexa-fluoropropylene copolymer resin (FEP) or tetrafluoroethylene/hexafluoropropylene/ perfluoroalkyl vinyl ether terpolymer resin (EPE)." Moreover, the accompanying remarks by PTI state: "All of the constituents of the filter element now claimed are not the same. The membrane material is PTFE but the net, seal, etc. are not . . . ." This narrowing of the net supporters limitation of claim 1 was clearly made for reasons related to patentability -- to avoid a prior art rejection made by the patent examiner.

Pursuant to Festo, application of the doctrine of equivalents is completely barred for a claim limitation that has been narrowed for reasons related to patentability. Id. at 574, 56 USPQ2d at 1877. Therefore, the doctrine of equivalents is not available as to the net supporters limitation of claim 1.

III. '465 Patent

Pall, the assignee of the '465 patent, argues that the district court improperly construed claims 1 and 9. On this appeal, PTI apparently concedes that the district court's claim construction was erroneous in requiring a unitary structure for the end caps. We agree that the claims do not require a unitary structure.

As previously noted, the district court construed claim 1 to require that "each claimed 'impervious end cap' cannot comprise two separate components, wherein the first component is welded to one end of an unsealed filter arrangement to provide a liquid-tight sealed end, and the second component is welded onto the previously-formed sealed end." Pall I, slip op. at 9-10. Before this court, Pall urges that "[t]he district court erred when it construed the claim element 'impervious fluoropolymeric end caps' to encompass only one-piece end caps, and excluded end caps formed by welding two components together."

We look first to the ordinary meaning of the disputed claim language. Claim 1 recites "first and second impervious fluoropolymeric end caps." In claim 1, the first end cap is further described as "including a cylindrical protrusion projecting away from the filter arrangement and containing means defining a central aperture communicating with the center of the filter arrangement." Contrary to the interpretation of the district court, the language of the claims does not indicate that the first end cap must be a unitary structure that cannot comprise two separate components that are welded together. Instead, the claim merely describes the first end cap as having a particular shape and containing an aperture. The ordinary meaning does not require that each of the first and second end caps be a unitary structure that cannot be made of two or more separate elements. Likewise,

the ordinary meaning does not require that each end cap be a single component that is applied in a single step.

Nor is there anything In the specification that suggests that the drafter intended to use the claim language in a manner different than its ordinary meaning. DeMarini Sports, Inc., v. Worth. Inc., 239 F.3d 1314, 1323, 57 USPQ2d 1889, 1893 (Fed. Cir. 2001) ("[T]he specification is reviewed to determine whether the patentee used terms in a manner inconsistent with their ordinary meaning."); Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582, 39 USPQ2d 1573, 1577 (Fed. Cir. 1996) ("[I]t is always necessary to review the specification to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning."). The specification here does not define any of the disputed claim language in a manner inconsistent with its ordinary meaning.

PTI concedes that its accused devices would infringe under the claim construction so far described above, but argues that the prosecution history requires a different construction of the claims. We have repeatedly held that, in addition to the specification, the prosecution history must be considered in construing claims. Biovail Corp. Int'I v. Andrx Pharm., Inc., 239 F.3d 1297, 1301, 57 USPQ2d 1813, 1816 (Fed. Cir. 2001) ("[W]e review both the specification and the applicable prosecution history to determine whether the patentee defined claim terminology in a manner inconsistent with its ordinary meaning."); Hockerson-Halberstadt, Inc. v. Avia Group Int'I, Inc., 222 F.3d 951, 955, 55 USPQ2d 1487, 1490 (Fed. Cir. 2000) ("The court, therefore, must examine a patent's specification and prosecution history to determine whether the patentee has given the term an unconventional meaning."); Southwall Techs., Inc. v. Cardinal IG Co., 54 F.3d 1570, 1576, 34 USPQ2d 1673, 1676 (Fed. Cir. 1995) ("Arguments and amendments made during the prosecution

of a patent application and other aspects of the prosecution history, as well as the specification and other claims, must be examined to determine the meaning of terms in the claims.").

PTI asserts that the patent prosecution history forecloses any interpretation of the claims that would include the subject matter of the accused devices, and that this court should not now interpret the claims to include the accused devices.

On March 4, 1986, during the prosecution of the '465 patent, Pall submitted an Information Disclosure Statement ("IDS") to the U.S. Patent and Trademark Office that listed a number of attached references, including a one-page brochure by HR Textron and PTI entitled "Fluoroflow™." The one-page brochure describes a filter cartridge called the Fluoroflow™ which is the trademark of a device manufactured by PTI.

The IDS and references were filed simultaneously with an amendment after final rejection. Pall's explanation accompanying the amendment included a concise statement of relevance for each reference as required by the information disclosure rules in effect at the time, 37 C.F.R. § 1.98 (1986). The concise statement of relevance for the brochure stated that: "The commercial literature of H.R. Textron describes an all-Teflon filter element having end caps, an outer support sleeve, upstream and downstream membrane supports, filter media, a core, and O-rings." The accompanying explanation also described the relevance of each of the other references, and concluded:

> *None of these materials [inciuding the brochure], disclose a filter cartridge or assembly as claimed in independent claims 1, 9 or 13 of the referenced application. For example, none of them disclose a filter cartridge of assembly having a cylindrical*

> *protrusion projecting away from the filter arrangement and a sealing ring cooperatively arranged with the first end cap, at least the external surface of said sealing ring comprising a fluoropolymeric material.*

(emphasis added).

PTI asserts that Pall's statement during prosecution of the '465 patent forecloses any interpretation of the claims that would include the PTI filter cartridges because these cartridges were described in the brochure. As discussed above, statements made during the prosecution history are used to interpret the scope and meaning of the patent claims. Alpex Computer Corp. v. Nintendo Co., 102 F.3d 1214, 1220, 40 USPQ2d 1667, 1671 (Fed. Cir. 1996); Southwall, 54 F.3d at 1576, 34 USPQ2d at 1676; Biodex Corp. v. Loredan Biomedical. Inc., 946 F.2d 850, 862-63, 20 USPQ2d 1252, 1262 (Fed. Cir. 1991). Statements made during prosecution that may be used in claim construction include statements that accompany an Information Disclosure Statement. Ekchian v. Home Depot, Inc., 104 F.3d 1299, 1304, 41 USPQ2d 1364, 1368 (Fed. Cir. 1997) (holding that "statements made in an IDS can be the basis for a court to interpret the scope of the claims of a granted patent"); Standard Oil Co. v. Am. Cyanamid Co., 774 F.2d 448, 452, 227 USPQ 293, 296 (Fed. Cir. 1985).

Even where the ordinary meaning of the claim is clear, it is well-established that "[t]he prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution." Southwall, 54 F.3d at 1576, 34 USPQ2d at 1676; see also Hockerson-Halberstadt, 222 F.3d at 956, 55 USPQ2d at 1491 ("Review of the prosecution history . . . reveals that the inventor disclaimed a particular interpretation of groove, thereby modifying the term's ordinary meaning."); Ekchian,

104 F.3d at 1304, 41 USPQ2d at 1368 (in the context of claim construction, stating that "by distinguishing the claimed invention over the prior art, an applicant is indicating what the claims do not cover, he is by implication surrendering such protection"); Biodex, 946 F.2d at 863, 20 USPQ2d at 1262 (in the context of claim construction, holding that "a particular interpretation of a claim term may have been disclaimed by the inventor during prosecution," and that "[a] disclaimer could be directed to interpretation."). Thus, this court has endorsed narrowing the interpretation of the claim to be consistent with a narrow claim scope urged by the applicant during the prosecution of the patent. See Standard Oil, 774 F.2d at 452-53, 227 USPQ at 296 (noting that "the prosecution history (or file wrapper) limits the interpretation of claims so as to exclude any interpretation that may have been disclaimed or disavowed during prosecution in order to obtain claim allowance" and that "[b]y making this disclaimer or concession, [the patentee] surrendered any interpretation of its claim that would include [the subject matter urged to be outside of the scope of the claims]"). Cf. Scimed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc., 242 F.3d 1337, 1341, 58 USPQ2d 1059, 1062-63 (Fed. Cir. 2001) (noting that even if a claim is broad, the specification may make clear that the invention does not encompass a feature that would be otherwise within the scope of the claim). This narrowing claim interpretation will be adopted if the accused infringer can demonstrate that the patentee "defined" the claim as "excluding" a broader interpretation "with reasonable clarity and deliberateness." N. Telecom Ltd. v. Samsung Elecs. Co., 215 F.3d 1281, 1294-95, 55 USPQ2d 1065, 1075 (Fed. Cir. 2000).

The public notice function of patents requires that a patentee be prevented from expressly stating during prosecution that the claims do not cover a particular device and then later suing for infringement by that same device.

Allowing such a suit would be unfair to the public, particularly the manufacturer of the accused device, which was entitled to rely on the surrender of claimed subject matter made in the prosecution history and contained in the file wrapper. Hockerson-Halberstadt, 222 F.3d at 957, 55 USPQ2d at 1491 (stating that, in the context of claim construction, "the prosecution history constitutes a public record of the patentee's representations concerning the scope and the meaning of the claims, and competitors are entitled to rely on those representations when ascertaining the degree of lawful conduct . . . . Were we to accept [the accused infringer's] position, we would undercut the public's reliance on a statement that was in the public record and upon which reasonable competitors formed their business strategies") (internal citations omitted); Vitronics, 90 F.3d at 1583, 39 USPQ2d at 1577 (in the context of claim construction, stating that "[t]he claims, specification, and file history . . . constitute the public record of the patentee's claim, a record on which the public is entitled to rely"). We accordingly must construe claims "to exclude any interpretation that was disclaimed during prosecution." Southwall, 54 F.3d at 1576; 34 USPQ2d at 1676.

In claim construction, a claim is interpreted from the perspective of one of ordinary skill in the art. Hockerson-Halberstadt, 222 F.3d at 955, 55 USPQ2d at 1490; K-2 Corp. v. Salomon S.A., 191 F.3d 1356, 1365, 52 USPQ2d 1001, 1006 (Fed. Cir. 1999). Cf. In re Cortright, 165 F.3d 1353, 1358, 49 USPQ2d 1464, 1467 (Fed. Cir. 1999) (using terms "one of ordinary skill in the art" interchangeably with "those skilled In the art"); Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1475, 46 USPQ2d 1169, 1191 (Fed. Cir. 1998) (en banc) (using terms "one of ordinary skill in the art" interchangeably with "one of skill in the art").

Here in the course of prosecution, Pall stated that the claims did not cover the subject matter disclosed in the brochure, thereby excluding any claim interpretation that includes that subject matter. See Southwall , 54 F.3d at 1576, 34 USPQ2d at 1676. The question then is - what did the brochure disclose? We must determine what one of ordinary skill in the art would believe to have been disclosed by the brochure. The brochure provides general information about the design of a Fluoroflow™ filter. The brochure states: "Fluoroflow™ is the first all-Teflon filter cartridge using Gortex as a filter media." The brochure then describes the material of construction for the end caps, outer support sleeve, upstream and downstream membrane supports, core, o-rings, and filter media. Under a section entitled "Cartridge Style" the brochure states: "Presently available with 222 o-rings." The brochure does not contain any drawings or photographs of the Fluoroflow™ filter cartridge.

Based upon the face of the brochure, it is unclear to us whether the filter cartridge disclosed in the brochure is the same or substantially identical to the accused device. More importantly, it is unclear whether one of ordinary skill in the art would believe the filter cartridge in the brochure includes all of the recited claim limitations, particularly the cylindrical protrusion and sealing ring cooperatively arranged with the first end cap.

Given the statement by Pall in the accompanying explanation in the prosecution history that none of the references (including the brochure) discloses "a filter cartridge . . . having a cylindrical protrusion . . . and a sealing ring," which are specifically recited in claim 1, it may be difficult for PTI to prove a disclaimer by Pall of any interpretation that includes the accused device. However, the district court did not address the issue of what one skilled in the art would believe to have been excluded after reviewing

the prosecution history as a whole, including the brochure and the statements of the applicant. We decline to affirm or reverse the district court's grant of summary judgment of non-infringement on a ground not addressed by the district court; therefore, a remand is necessary. On remand both parties should be given a further opportunity to submit evidence directed to the extent of the disclosure of the brochure to one of ordinary skill in the art. The determination of the scope of the exclusion of subject matter during prosecution for purposes of claim construction is a matter of law to be made after examination of the appropriate evidence.

The district court remains free, of course, to entertain a new motion for summary judgment on these issues.

CONCLUSION

Therefore, we affirm the district court's decision on the '041 patent, but vacate and remand to the district court for further proceedings on the '465 patent consistent with this opinion.

AFFIRMED-IN-PART. VACATED-IN-PART, AND REMANDED.

COSTS

No costs.

APPENDIX B

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF NEW YORK

PALL CORPORATION,

Plaintiff

MEMORANDUM AND ORDER

- against -

CV-97-1134 (DGT)

PTI TECHNOLOGIES INC.,

CV-98-2871 (DGT)

Defendant,

and

KURABO INDUSTRIES, LTD.,

Counterdefendant.

TRAGER, J.

FINDINGS OF FACT

I. Background of the Action

1. This action is a consolidation of two separate actions for patent infringement, Civil Action Nos. CV-97-1134 and CV-98-2871, and includes related declaratory judgment counterclaims. Uncontested Facts ¶ 2.1.

2. Plaintiff Pall Corporation ("Pall") is a New York corporation, with its principal place of business in East Hills, New York. Pall is the owner by assignment of U.S. Patent 4,609,465 ("the Miller `465 patent"), and asserts claims 1 and 9 of that patent against defendant PTI Technologies, Inc. ("PTI"). Pall seeks a finding of infringement and entry of a permanent injunction against certain all-fluoropolymer filter cartridge products made, sold and offered for sale by PTI, namely the Fluoroflow filter cartridges. Uncontested Facts ¶ 6.1.

3. Defendant PTI Technologies, Inc. ("PTI") is a Delaware corporation having its principal place of business in Newbury Park, California. PTI is the owner of U.S. Patent 4,663,041 to Miyagi et al. ("the Miyagi `041 patent"). PTI acquired ownership rights in this patent from the Counterdefendant, Kurashiki Baseki Kabushiki Kaisha, known as Kurabo Industries, Ltd.), while this action was pending. PTI asserts in a counterclaim that Pall infringes claims 1-5 of the Miyagi '041 patent. PTI seeks a finding of infringement and entry of a permanent injunction against certain all-fluorocarbon filter products made, sold and offered for sale by Pall. Uncontested Facts ¶ 6.2.

4. Pall, in a counterclaim asserted against both PTI and Kurabo Industries, Ltd., seeks a judicial declaration that no product made, used, sold, offered for sale or imported by Pall infringes any claim of the Miyagi `041 patent. Uncontested Facts ¶¶ 2.3, 2.4.

5. Should the Court of Appeals for the Federal Circuit affirm the construction of the asserted claims reached by this Court, and affirm the summary judgments of noninfringement entered in favor of Pall and PTI by this

Court, Pall and PTI will not contest the validity and enforceability of the asserted claims as construed herein by this Court. Pall, further does not contest the inventorship and ownership of the Miyagi '041 patent based on the construction of the claims as construed herein, and was given permission to withdraw its motion for correction of inventorship of the Miyagi '041" patent (and its parent patent) without prejudice to reinstate that motion at a later date.

6. The patent infringement counts in this action arise under the patent laws of the United States as set forth at 35 U.S.C. § 1 *et seq.* This Court has jurisdiction over these counts, and over Pall's counterclaim for declaratory relief, pursuant to 28 U.S.C. §§ 1331, 1332, 1338 and 2201.

II. History of the Action

7. Pall initiated an action for patent infringement against PTI in the Central District of California on December 9, 1993. In its Complaint, Pall charged PTI with infringement of U.S. Patent 4,340,479 ("the '479 nylon patent") which relates to a process for preparing hydrophilic polyamid membrane filter media and products. Uncontested Facts ¶ 3.1.

8. On February 14, 1994, PTI responded to Pall's charge of infringement of the '479 nylon patent with an Answer that contained both denials and affirmative defenses. Specifically, PTI alleged that pursuant to a judgment entered in favor of Pall in an action entitled *Pall Corporation v. Micron Separations, Inc.*, 792 F. Supp. 1298 (D. Mass. 1992) and a consent decree entered into by Pall in connection with the bankruptcy proceeding related to that action, *In re Micron Separations, Inc.*, No. 91-41885-JFO (Bankr. D. Mass.), PTI had not manufactured,

used or sold any allegedly infringing products that were not covered by the agreements between PTI's suppliers of polyamide membrane media and Pall. Uncontested Facts ¶ 3.2.

9. Further, PTI alleged that it had been, and was, licensed to use and sell products purchased from Micron Separations, Inc., and to manufacture, use and sell products incorporating those membranes. Uncontested Facts ¶ 3.3.

10. In its Answer, PTI also counterclaimed against Pall alleging infringement of the '041 Miyagi patent. Uncontested Facts ¶ 3.4.

11. On March 28, 1994, Pall filed a Reply in response to PTI's counterclaim denying infringement of the Miyagi '041 patent and asserting affirmative defenses. Pall also asserted its own counterclaim against both PTI and Kurabo, seeking declaratory relief. It sought a declaration against both PTI and Kurabo that Pall does not infringe the '041 patent, and that the '041 patent was invalid, void and/or unenforceable. Uncontested Facts ¶ 3.5.

12. On May 10, 1995, the California action was stayed pending the outcome of the Court of Appeals for the Federal Circuit's decision in the Pall v. Micron Separations, Inc. appeal concerning the '479 nylon patent. On March 19, 1998, after resolution of Pall's legal proceedings against Micron Separations, Inc., and upon a joint stipulation of the parties, the Court dismissed Pall's action and PTI's counterclaim relating to infringement of the '479 nylon patent. Uncontested Facts ¶3.6.

13. In the meantime, Pall instituted a patent infringement action against PTI in this Court on March 7, 1997, charging PTI with infringement of Pall's Miller '465

patent. PTI counterclaimed on May 5, 1997, seeking a declaration that the Miller `465 patent is invalid and not infringed. Uncontested Facts ¶ 3.7.

14. Thereafter, the California action was transferred to this Court, and the two actions were subsequently consolidated. Uncontested Facts ¶ 3.8.

15. An evidentiary hearing was held to construe the asserted claims of the Miller `465 and Miyagi `041 patents. This hearing also resolved the issue of infringement, both literal and under the doctrine of equivalents, with respect to both the Miller `465 patent and the Miyagi `041 patent by summary judgment. PTI opposes entry of a summary judgment that no Pall product infringes any claim of the Miyagi `041 patent under the doctrine of equivalents as construed. Pall opposes entry of a summary judgment that no PTI product infringes the asserted claims of the Miller `465 patent either literally or under the doctrine of equivalents.

16. After hearing and considering the evidence presented by the parties at the hearing, this Court finds that no Pall product infringes, either literally or under the doctrine of equivalents, any claim of the Miyagi `041 patent, and that no PTI product infringes, either literally or under the doctrine of equivalents, asserted claims 1 and 9 of the Miller `465 patent.

III. Background of the Technology

17. In the late 1970's and early 1980's, as computer technology advanced, the semiconductor industry began increasing the amount of circuitry on a computer chip. To apply more circuitry without increasing the size of the chip, acids at higher concentrations and temperatures were

used to etch the layers of the chip with the required higher level of precision. Tr. 115-16.

18. After these acids are used in the etching process, however, they are contaminated with debris from the etching process. The etchant-contaminated acids cannot simply be discarded. A means is required to purify the contaminated acid so it can be reused. PTX 1 at col. 1, lines 10-24. Thus, a need developed during the early 1980's for a filter that could withstand high-temperature corrosive chemicals, such as hot acids.

III. The Miller '465 Patent

A. *Background and Overview of the Miller '465 Patent*

19. The all-fluorocarbon filters claimed in the Miller `465 patent are able to remove the impurities from the acid to a sub-micron level, while withstanding the destructive effects of the high-temperature acid. PTX 1 at col. 1, lines 37-43; Tr. 70-72, 115-16, 215-16

20. The Miller `465 patent, issued September 2, 1986, concerns a filter cartridge made using fluoropolymer components. PTX 1.

21. The term fluoropolymer, as used in the context of the Miller 465 patent, includes among other materials PTFE, FEP, PFA, EPE and PVDF. PTX 1 at col. 4, line 43 to col. 5, line 23.

22. In actual use, the filter cartridge of the Miller '465 patent is attached to a corrosive fluid reclamation system. The attachment occurs by inserting the end having

the cylindrical protrusion and encapsulated O-ring into a mating connection on a filter housing that is part of the reclamation system. Filter housings used with the cartridge include an inlet, which permits contaminated fluid to enter the housing, and an outlet through which purified fluid exits the housing. Upon operation, contaminated fluid enters the housing, passes from the exterior of the filter cartridge, through the filter membrane which purifies the fluid, and into the interior core of the cartridge. The purified fluid is then directed out of the cartridge by the end caps, and exits the housing. Tr. 70-72; PTX 57; PDE 46; PTX 1 at col. 3, line 60 to col. 4, line 10.

23. Given the harmful nature of the fluids being filtered, the Miller '465 cartridge was further designed with a configuration that allows it to be quickly and easily inserted and removed from the filter housing, and further provides a sealing configuration that withstands the destructive effects of the acid being purified. Should the seal between the cartridge and housing fail, contaminated fluid would enter the production processing stream, causing defects in the semiconductor products. PTX-1; Tr. 72.

24. The cartridge of the Miller `465 patent provides the foregoing liquid-tight seal by including a first end cap that includes a cylindrical protrusion having at least one sealing ring cooperatively arranged with that end cap, wherein at least the exterior surface of the sealing ring comprises a fluoropolymeric material. PTX 1 at Col. 5, lines 46-54. The cartridge as a whole is thus impervious to the harmful effects of the destructive fluids undergoing purification. PTX, 1 at col. 1 at lines 37-48; Tr. 72.

25. Claim 1 of the Miller `465 patent is set forth below:

A filter cartridge for removing particulates from a destructive fluid, said filter cartridge comprising a cylindrical filter arrangement having a generally annular cross section and including a cylindrical microporous fluoropolymeric filter for, removing particulate contaminants from fluid flowing through the filter and further including a. cylindrical fluoropolymeric structure disposed adjacent the filter for supporting the filter, first and second impervious fluoropolymeric end caps concentrically disposed adjacent first and second ends, respectively, of the filter arrangement, said first end cap including a cylindrical protrusion projecting away from the filter arrangement and containing means defining a central aperture communicating with the center of the filter arrangement and said second end cap enclosing said second end of the filter arrangement, and a sealing ring cooperatively arranged with the first end cap, at least the external surface of said sealing

ring comprising a fluoropolymeric material.

PTX 1 at Col. 5, lines 36-54.

26. Claim 9 of the Miller '465 patent, which depends from claim 1, is set forth below:

> The filter cartridge of claim 1
>
> wherein the first and second end caps comprise a PFA fluorocarbon polymer.

PTX 1 at col. 6, lines 22-24.

27. With respect to the Miller `465 patent, the first issue before this Court is to properly construe, as a matter of law, claims 1 and 9 of the Miller `465 patent. More specifically, this Court is asked to determine the proper meaning of "first and second impervious fluoropolymeric end caps" as set forth in claim 1. The second issue is whether any PTI filter infringes claim 1 and/or 9 of the Miller `465 patent, either literally or under the doctrine of equivalents.

B. *The Proper Construction of the Claim Element "First and Second Impervious Fluoropolymeric End Caps" Excludes End Caps Prepared Using Two Separate Components Which Are Applied In Two Separate Steps.*

28. The words "first and second impervious fluoropolymeric end caps" in the context of the claims of the `465 patent means that each end cap is a unitary structure that is applied to respective unsealed ends of a "filter arrangement." In the context of the Miller `465 patent, the filter arrangement is an element having a generally annular cross-section and includes a cylindrical microporous fluoropolymeric filter (e.g., PTFE membrane) and a cylindrical fluoropolymeric structure adjacent the filter for supporting the filter (e.g., core). In other words, each claimed "impervious end cap" cannot comprise two separate components, wherein the first component is welded to one end of an unsealed filter arrangement to provide a liquid-tight sealed end, and the second component is welded onto the previously formed sealed end. Tr. 508-09.

29. The words used in claims 1 and 9 of the Miller `465 patent other than "impervious fluoropolymeric end caps" should be afforded their plain and ordinary meaning.

30. The claimed end caps function to support the filter arrangement and to prevent the destructive fluid from bypassing the filter arrangement. PTX 1 at col. 3, lines 15-17.

31. This claim construction is consistent with an embodiment of the filter disclosed in the drawings and written description of the Miller `465 patent. PTX 1. Figure 1 of the patent is set forth below:

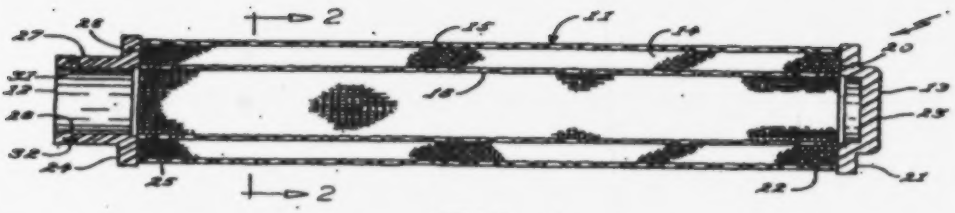

FIG. 1

PTX 1. The written description of the patent identifies the various components included in the figures (e.g., Figure 1) as follows:

Indicia	Description
12	top end cap (open)
13	bottom end cap (closed)
14	filter composite (PTFE membrane sandwiched by two net supporters)
16	inner perforated core
32	sealing ring (0-ring)
27	cylindrical protrusion
28	

PTX 1 at col. 2, line 64 to col. 3, line 42.

C. *Claims 1 and 9 of the Miller `465 Patent Are Not Infringed By PTI's All-Fluoropolymer "Fluoroflow;" Filter Products Either Literally or Under The Doctrine of Equivalents Because They Do Not Possess The Claimed "First and Second Impervious Fluoropolymeric End Caps."*

32. The accused PTI Fluoroflow filter cartridges (e.g., PTX 46-48), are used in the filtration of destructive fluids. As cartridges, they are used after insertion into a housing. PTX 162.

33. The accused Fluoroflow cartridges are manufactured using only PTFE, PFA and/or FEP components. Tr. 233; PTX 162. Specifically, a PTFE filter membrane is sandwiched between two PFA or FEP porous woven mesh net supporters. The filter membrane and net supporters are pleated, and the side edges of the filter membrane are sealed to one another using the resin of the net supporters. The resulting structure is cylindrical in shape. A PFA or FEP perforated support core is located interior of the aforesaid cylindrical structure. Tr. 197-01; 233; PTX 162.

34. The manufacture of the Fluoroflow cartridges continues with the use of a FEP or PFA "potting disk." This component, similar in shape to a washer, is heated until. it is molten, with one end of the PTFE membrane, net supporters and core combination being inserted into the molten potting disk. The potting disk is then allowed to cool, thereby sealing one end of that combination. This process is repeated to seal the second end of that combination. Subsequently, PTI welds what it refers to as an end cap, or fitting, onto each sealed end. After welding is completed, the core, potting disk and end cap at each end are integral with one another. Tr. 237-40; PTX 46; PDE 49A.

35. One end of the accused Fluoroflow filter cartridges includes an annular channel into which a sealing ring can be placed. About 80 percent of Fluoroflow cartridges sold by PTI include in that channel a sealing ring having a fluoropolymer external surface, e.g., FEP-encapsulated silicone. Tr. 233-35; PTX 162.

36. The accused Fluoroflow cartridges do not infringe claims 1 and 9 of the Miller `465 patent because two components, i.e., a potting disk and end cap (the latter aka a fitting), are applied in two-steps to provide each of the claimed "impervious fluoropolymeric end caps." Tr.

508-09. Neither the potting disk nor the end caps used in the two-step process to provide the Fluoroflow cartridges individually meet all of the limitations of the "impervious fluoropolymeric end caps" set forth in the claims. Further, the claimed "impervious fluoropolymeric end cap" requires a single component of the claimed filter, applied in a single-step, to provide all the functions thereof, i.e., supporting the claimed filter arrangement (core and PTFE membrane) and preventing the destructive fluid from bypassing the filter arrangement. For these reasons, the accused Fluoroflow cartridges do not infringe claims 1 and 9 of the Miller `465 patent, either literally or under the doctrine of equivalents.

IV. The Miyagi `041 Patent

A. *Background*

37. The Miyagi '041 patent, issued May 5, 1987, concerns a filter element made entirely of fluorocarbon resins, i.e., an "all-fluorocarbon" filter. PTX 14.

38. In the context of the Miyagi '041 patent, fluorocarbon resin materials include, among others, PTFE, PFA, FEP and EPE. Of these materials, PFA, FEP and EPE are thermoplastic fluorocarbon resins. PTX 14. PTFE is not a thermoplastic fluorocarbon resin. Tr. 222.

39. Prior to the effective filing date of the Miyagi '041 patent, the filtration industry had not used a mixture of two different fluorocarbon resin materials to fabricate a net supporter. Tr. 148, 485.

40. The Miyagi '041 patent includes one independent claim (claim 1) and four dependent claims (claims 2-5). PTX 14.

41. Claim 1 of the Miyagi '041 patent is set forth below:

> A filter element consisting of fluorocarbon resin elements and comprising as essential elements a filter material produced by folding a sandwich-form sheet comprising a filter membrane made of tetrafluoroethylene resin (PTFE) and net supporters made of tetrafluoroethylene/perfluoroalkyl vinyl ether copolymer resin (PFA), tetrafluoroethylene/-hexafluoropropylene copolymer resin (FEP) or tetrafluoroethylene/hexafluoropropylene/-perfluoroalkyl vinyl ether terpolymer resin (EPE) superimposed on the both surfaces thereof into a pleat form and liquid-tightly welding the edges parts of the both sides of the pleated sheet, sealed end parts produced by embedding the both end part of said filter material except the central openings into a thermoplastic fluorocarbon resin selected from the group consisting of PFA, FEP and EPE to force the resin into the pleats, whereby the both end parts are each integrally and tightly welded, and fluorocarbon resin caps welded liquid-tightly with said sealed end parts.

PTX 14 at col. 6, lines 30-48.

42. The first issue before this Court is to properly construe, as a matter of law, claims 1-5 of the Miyagil`041 patent. More specifically, this Court is asked to determine the proper meaning of: (1) "net supporters made of PFA, FEP or EPE" and (2) "sealed end parts" and "fluorocarbon resin caps" recited in claim 1. This Court

then considers whether any Pall filter product infringes any claim of the patent, either literally or under the doctrine of equivalents.

B. *The Proper Construction of the Claim Element "Net Supporters Made of PFA, FEP or EPE" Excludes Any Material other Than PFA, FEP or EPE.*

43. The words "net supporters made of PFA, FEP or EPE" in the context of the `041 patent means that the net supporters must be made wholly of PFA, FEP or EPE, and cannot include any other fluorocarbon resin (e.g., PTFE) therein. In other words, the claimed "net supporters" cannot (1) be a mixture of two or more of the three materials specified or (2) contain a material other than PFA, FEP or EPE, e.g., PTFE. Tr. 125-26, 128.

44. Similarly, the claims also use the same "made of" language in connection with a PTFE membrane. PTFE filter membranes have always contained 100 wt.% PTFE. Thus, the use of the "made of" language in claim 1 connotes a component made wholly of one material (100 wt.% PTFE in the case of the membrane). PTX 1; Tr_ 123-24.

45. The words "made of" in the context of the `041 patent mean that materials other than those specifically recited in the claim should be excluded. Tr. 94-96, 123-25.

46. This construction is also consistent with the specification and prosecution history of the `041 patent. Tr. 126-28; PTX 14, 15.

47. The specification refers to the net supports as being provided from a single thermoplastic fluorocarbon

material, with the filter membrane also being provided from a single fluorocarbon material:

> The filter membrane of a fluorocarbon resin, especially PTFE, is placed between thermoplastic fluorocarbon resin net supporters in a sandwich form. These supporters are a spacer for the filter membrane.
>
> As a material for the net supporter, there are used thermoplastic fluorocarbon resins such as . . . PFA . . . FEP . . . ETFE . . . PCTFE . . , ECTFE . . . PVDF . . . PVF . . . EPE . . . . Particularly preferred ones are PFA, FEP and EPE in terms of chemical resistance and temperature resistance.

PTX 14 at col. 3, 11. 16-19 and 31-47. The specification does not disclose the use of any non-thermoplastic fluoropolymer (e.g., PTFE) as a net supporter material. Tr. 372.

48. The only example of a filter provided by the Miyagi `041 patent includes a 100% PTFE membrane and 100% EPE net supporters superimposed above and below the filter membrane. PTX 14 at col. 5, 11. 44-49; Tr. 368.

49. The specification of the patent does not disclose the net supporters, filter material, or any other component of the filter element as being prepared from a mixture of two or more fluorocarbon resin materials. PTX 14; Tr. 126-27.

50. Since their introduction, none of the all-fluorocarbon filter cartridges commercialized by Kurabo and PTI under the `041 patent contained any net supporters

prepared from a mixture of two or more of these fluorocarbon resins identified in the `041 patent as being suitable for the net supporter, e.g., at least two of PFA, FEP, ETFE, PCTFE, ECTFE, PVDF, PVF and EPE. Tr. 223, 331, 351-52, 367

51. The prosecution history provides further support for the claim construction. Tr. 127-28. The claims of the `041 patent as originally filed were broad, covering "net supporters made of a thermoplastic fluorocarbon resin" and "a filter membrane made of a fluorocarbon resin." PTX 15 at 15-17.

52. The U.S. Patent and Trademark Office ("Patent Office") rejected those claims over an earlier Pall patent, U.S. Patent 4,154,688.The Examiner asserted that Pall's `688 patent taught a filter cartridge in which all of the components are made of the same fluorocarbon material. PTX 15 at 46-47; Tr. 127-28.

53. The `041 patentees, in response to the rejection, changed the language of claim 1 to "a filter membrane made of PTFE" and "net supporters made of PFA, FEP or EPE." The patentees also told the Examiner that:

> All of the constituents of the filter element now claimed are not the same. The membrane material is PTFE *but the net, seal, etc. are not* because there is risk that the filter membrane would be damaged if melting at a welding temperature is attempted.

PTX 15 at 52-54 (emphasis added); Tr. 127-28.

54. A Declaration was also submitted with the patentees' response. The Declaration contains an experiment which the patentees' characterize as being in accordance with "the present invention." The membrane used in the experiment is a 100% PTFE membrane. PTX 15 at 56; Tr. 309.

55. The significance of the prosecution history is two-fold. First, the patentees' remarks in the Amendment affirmatively state that the membrane material "is" PTFE, i.e., it constitutes 100% PTFE. The Experiment in the Declaration, which is characterised as "the present invention," uses 100% PTFE as the membrane and 100% PFA net supporters. PTX 15 at 52-54; Tr. 309-10. Thus, the evidence elicited at the hearing and arguments offered by the parties indicates that there is no dispute that the "filter membrane made of PTFE" recited in claim l refers to a filter membrane that is 100% PTFE. Tr. 96, 123-24, 309-10. One must therefore conclude that the words "made of" in relation to the filter membrane element mean made wholly of, or 1008 of, PTFE. The net supporters, which include the same "made of" language, must be construed in a consistent manner. Tr. 123-25. The claimed "net supporters" therefore include l00% of one of the three recited thermoplastic fluorocarbon resins, PFA, FEP or EPE. Tr. 94-98, 109-10, 123-25, 128.

56. Second, the patentees' remarks distinguished the filter membrane material from that of the net supporters in order to obtain allowance of the claims over the Pall ` 88 patent. PTX 15 at 52-54. In stating that the membrane material is PTFE but the net is not, the `041 patentees indicated that the claimed "net supporters" do not include any PTFE. PTX 15 at 54.

C. *Claims 1-5 of the Miyagi `041 Patent Are Not Infringed By Any Pall All-Fluoropolymer Filter Product Because They Do Not Possess The Claimed "Net Supporters Made of PFA, FEP or EPE."*

57. The all-fluorocarbon filter products made, use, sold, offered for sale and imported by Pall include a PTFE membrane having support and drainage layers on each side of the membrane. These support and drainage layers correspond to the claimed "net supporters." Tr. 76-78. The support and drainage layers in each Pall filter product contain at least 60 wt.% PTFE. Tr. 79-80. Specifically, one class of accused Pall products contain support and drainage layers having about 2/3 by weight PTFE fibers (with 1/3 by weight FEP to bind the PTFE fibers to one another), while a second and more recent class of Pall products contains support and drainage layers of 100% PTFE. Tr. 79-80.

58. No Pall product literally infringes any claim, of the '041 patent because none contain a component, e.g., a support and drainage layer, that corresponds literally to the `net supporters made of PFA, FEP or EPE" claim element. Tr. 488.

59. Moreover, no Pall product infringes any claim of the `041 patent under the doctrine of equivalents. The specification of the '041 patent does not support a scope of equivalents that would capture a mixture of PFA, FEP or EPE and a different, non-thermoplastic resin, e.g., PTFE, particularly when the non-thermoplastic component is the majority component by weight (at least 60 wt.%). See supra 46-48. Such a mixture constitutes a substantial, as opposed to an 'insubstantial, difference. Tr. 485-86.

60. Moreover, PTI is estopped from arguing a component having any PTFE, let alone at least 60 wt.% PTFE (and up to 100 wt.* PTFE), is equivalent to the claimed "net supporters made of PFA, FEP or EPE." The estoppel arises from a combination of the language of the claim, the specification of the patent, the prior art, and the prosecution history, wherein in the latter the `041 patentees' amendments and arguments made to the Patent Office (as detailed above) in order to secure allowance of the claims. Tr. 126-28, 478-79, 485.

D. *The Proper Construction of the "Sealed End Parts" and "Fluorocarbon Resin Caps" Claim Elements of Claims 1-5*

61. The proper construction of the claim elements "sealed end parts" and "fluorocarbon resin caps" requires two separate elements to be joined. The "fluorocarbon resin caps" are welded to the "sealed end parts" to complete the filter element. Tr. 128, 503-04. This construction is consistent with the plain and ordinary language of the claim and the specification. PTX 14; Tr. 128, 503-504.

62. The ' 041 patent states that "Figure 1 of the 041 patent is a typical view illustrating the filter element of the present invention (in the view, the filter material and the cap are shown separately)." PTX at col. 2, lines 9-11. Figure I of the '041 is as follows:

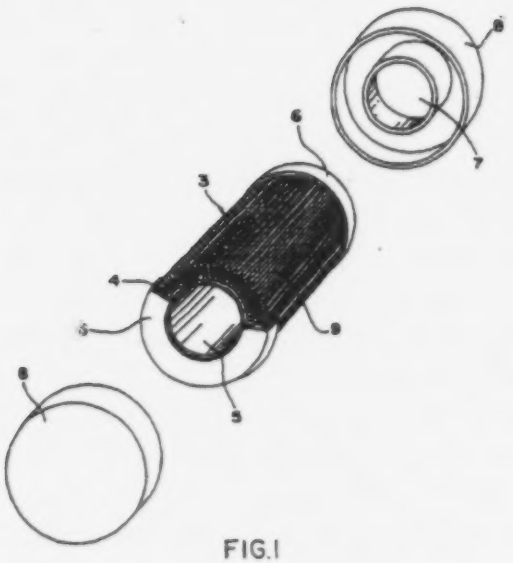

FIG.I

PTX. 14.

63. The specification of the `041 patent identifies the various components included in the figures (e.g., Figure 1) as follows:

Indicia	Description
1	filter membrane
2	net supporters
3	filter material produced by folding sandwich-form sheet comprising a filer membrane (indicia no. 1) and net supporters (indicia no. 2) superimposed on the both surfaces thereof into a pleated form and liquid-tightly welding the edge parts of the both sides of the pleated sheet into a cylinder.
4	end parts of the filter material (3)
6	sealed end parts of the filter material
8	fluorocarbon resin cap

PTX 14 at col. 2, lines 29-46.

64. Apart from the use of different materials, e.g., PFA, PEP, the specification further describes using only one set of components to provide for the assembly of the chimed sealed end parts and fluorocarbon resin caps, a sealing) fluorocarbon resin and a separate fluorocarbon resin cap . The sealed end parts of the filter element are formed by embedding both ends of the filter material (3) (except the opening in each end (5)) into a thermoplastic fluorocarbon resin. This is carried out by filling a circular (i.e., doughnut-shaped) mold with a sealing thermoplastic fluorocarbon resin (PPA, PEP or EPE) that can receive an end part of the filter material, heating the resin until it melts, and pressing the end part into the molten resin to force the resin into the pleats of the filter material. The heating is continued until the surfaces of the ends of the filter material (the PTFE membrane and two net supporters) are melted and form an integrated mass with the fluorocarbon resin. This procedure is repeated to provide two sealed end parts. PTX 14 at Col. 4, lines ,33-45; Col. 6, lines 3-15.

65. According to the specification, after two sealed end parts are formed, a fluorocarbon resin cap (a component that is separate and apart from that used to form the sealed end part) is welded with each sealed end part. This welding completes the filter element of the `041 patent. PTX ll4 at Col. 4, lines 33-41; col. 6, lines 3-15; col. 6, 1120-24; Tr. 129-30, 157.

64. The specification characterizes the sealed end parts (6) and fluorocarbon resin caps (8) as being "essential elements" of the filter element of the `041 patent. PTX 14 at Col. 2, lines 29-31 and 38-46.

67. Moreover, the specification of the `041 patent states that when the sealed end parts (6) are not previously formed, welding between the fluorocarbon resin cap (8) and

the filter material is incomplete and fails to provide a completely sealed filter element. PTX 14 at Col. 5, lines 7-10; 129-130.

68. Figure 6 illustrates sealed end parts (6) welded liquid-tightly to fluorocarbon resin caps (8)

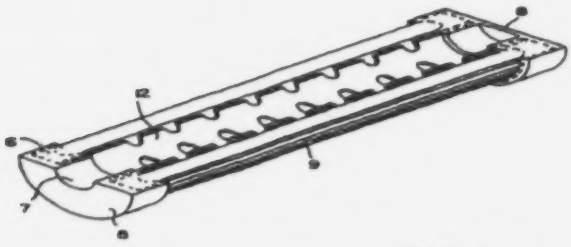

FIG. 6

69. The specification of the `041 patent provide further information relevant to the proper construction of these claim elements. In the background section, the `041 patentees describe how the claim elements should not be construed-that the end-capping set forth in Pall's U.S. Patent 3,457,339 ("the `339 patent") *"can not be applied to a filter element made wholly of fluorocarbon."* PTX 14 at col. , lines 62-63 (emphasis added); Tr. 130-31, 503.

70. The *`339* patent describes a filter prepared using a particular process for applying end caps to a filter sheet material formed in a substantially tubular shape. The process includes liquefying an inside face of a thermoplastic end cap to from about 10 to about 90 % of the thickness of the end cap while maintaining the remainder of the end cap in a solid state, embedding all the edges of one end of the relatively cold filter material in the liquefied face of the end cap, allowing the liquefied thermoplastic material to permeate the pores of the filter material, and hardening the liquid, plastic, thereby bonding the end cap to the filter

material and forming a leakproof seal there between. This procedure can be repeated for capping the other end of the filter. PTX at col. 3, lines 30-44, col. 3, 1. 72 to col. 4, 1. 16; Tr. 184-85, 188-89, 503.

71. Claim 1 cannot be construed so broadly as to include a sealed filter element prepared by welding a one-piece end cap onto the end of a pleated, unsealed, pleated filter pack, the pack including a-filter membrane and support layers, Tr. 503, 508-09.

E. *Claims 1-5 of the Miyagi `041 Patent Are Not Infringed By Any Pall All-Fluoropolymer Filter Product Because They Do Not Possess The Claimed "Sealed End Parts" And "Resin Caps."*

72. The Pall process for preparing all-fluoropolymer filter products (e.g., PTX 53, 54, 57) begins by forming a pleated filter element. This element includes a PTFE membrane and two support and drainage layers on each side of the membrane. The Pall support and drainage layers include at least 60 wt. PTFE, and up to 1008 PTFE. Tr. 78-80, 374-75.

73. After the element is pleated, and the side seam is sealed, an inner perforated core (and, optionally, an outer perforated cage) is added, thereby forming a filter arrangement. Tr. 81-82; PTX 59, 60. This is also referred to as a filter pack or pleat pack. Tr. 104.

74. Thereafter, the end-capping of the filter arrangement, as developed by Pall and set forth in Pall's `339 patent; is carried out. In sequence, one end of the filter arrangement is pre-heated, the surface of the end cap is melted to a predetermined depth, and the end of the filter arrangement and end cap are then joined. The

pre-heated end of the filter arrangement is maintained relatively cold as compared to the temperature of the molten resin of the end cap to prevent undesirable wicking of the end cap resin into the filter arrangement when the parts are joined. Tr. 82-85; PTX 3.

75. This "end-capping" process is then repeated o the other end of the filter arrangement to provide a finished product. Tr. 82-85.

76. The resulting Pall filter products do not require a fluorocarbon resin cap to be welded thereto, as required by the '041 patent claims. The Pall all-fluorocarbon filter products therefore do not literally infringe any claim of the 041 patent. Tr. 130-31, 503 504.

77. Moreover, no Pall filter product infringes any! claim of the `041 patent under the doctrine of equivalents. In applying for the patent, the `041 patentees described the claims as not including a filter construction and related process such as that set forth in the prior art Pall `339 patent, i.e., wherein a single-piece end cap is applied directly onto an unsealed end of the filter pack (or filter arrangement). That construction and process, however, is and has been used by Pall to prepare the subject all-fluoropolymer filter products. The '41 patentees, having distinguished the application of a single-piece end cap directly onto an unsealed end of the filter pack (or filter arrangement) to obtain the `041 patent, cannot now recapture this disavowed subject matter. See supra ¶ ¶ 68-69; Tr. 503-05.

78. Further, the specification of the `041 patent describes only a single construction for its filter element, i.e., providing sealed end parts using specific procedures and materials prior to welding a separate component-the resin

caps-thereto. Specifically, no resin from the end caps is used to provide the "sealed end parts." Based upon this, specific, limited disclosure, the claims of the `041 patent cannot include a filter product having the construction of the Pall filter products under the guise of the doctrine of equivalents. See supra ¶ ¶ 61-67; Tr. 503-04.

79. PTI also acknowledged on two separate occasions that there exist substantial differences as between its own all-fluorocarbon filter products (marked with the `041 patent number) and Pall's all-fluoropolymer filter construction. PTX 133, 141; Tr. 224-226, 231-232.

CONCLUSION

Based on the foregoing findings of fact,

(1) summary judgment is GRANTED in favor of PTI, dismissing Pall's claim that PTI has infringed the Miller '465 Patent;

(2) Pall's application for a permanent injunction against PTI is DENIED;

(3) summary judgment is GRANTED in favor of Pall, dismissing PTI's counterclaim that Pall has infringed the Miyai '041 Patent;

(4) PTI's application for a permanent injunction against Pall is DENIED; and

(5) Pall's application for a judicial declaration that no product made, used, sold, offered for sale or imported by Pall infringes any claim of the Miyagi '041 Patent is GRANTED.

The Clerk of Court is directed to enter judgment and close the case.

Dated: Brooklyn, New York
December 22, 1999

SO ORDERED:

_____

David G . Tracer
United States District Judge